Trend Study 30-45-03

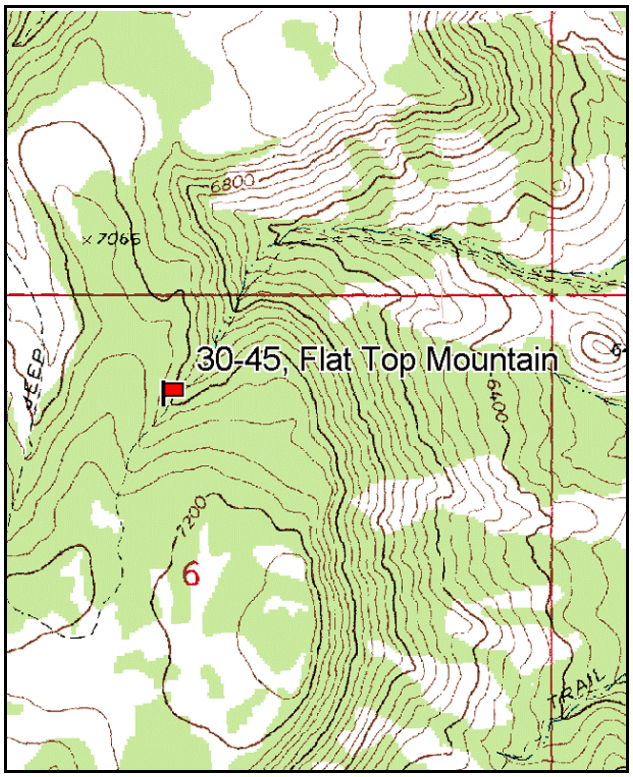
Study site name: Flat Top Mountain . Vegetation type: Oakbrush .

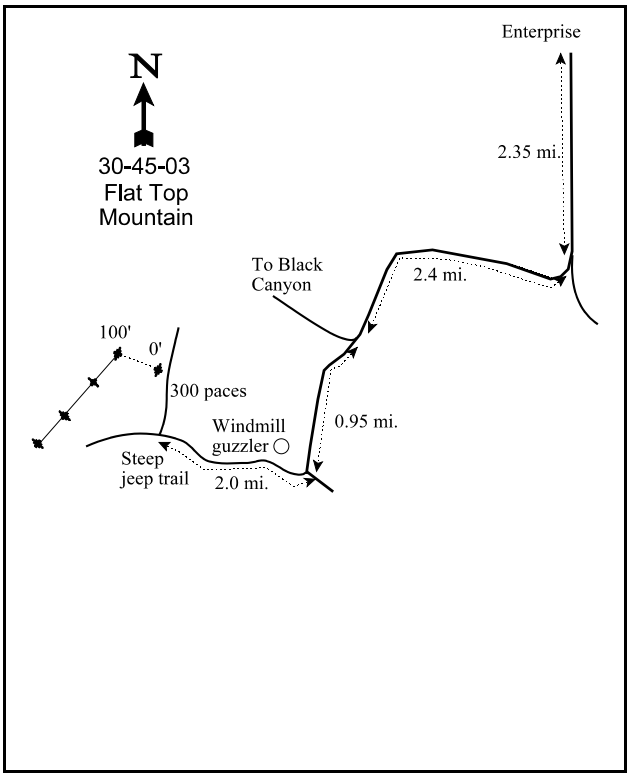
Compass bearing: frequency baseline 285 degrees magnetic. (Lines 2-4, 220°M)

Frequency belt placement: line 1 (1 & 92ft), line 2 (59ft), line 3 (34ft), line 4 (71ft). Rebar: belt 1 on 8ft.

LOCATION DESCRIPTION

From the town of Enterprise, go south on 200 East for 2.45 miles, at which point there will be a fork in the road. Take a right and head towards Calf Springs. Stay on the main road for 2.3 miles until arriving at another fork in the road marked by a sign "Black Canyon." Do not proceed towards Black Canyon. Take the left fork for 0.95 miles until arriving at another fork in the road. Take the right fork (F.S. Road 351) for 2.0 miles until the road turns into a steep jeep trail. Approximately 300 paces up the road from where it first becomes steep and rough will be an intersection (you can drive all the way to the intersection). Walk 10 paces down the road to the left (west). The 0-foot baseline stake is located 11 paces north of the road. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height.





Map Name: Hebron

Diagrammatic Sketch

Township 38S , Range 17W , Section 6

GPS: NAD 27, UTM 12S 4155402 N, 252530 E

DISCUSSION

Flat Top Mountain - Trend Study No. 30-45

This trend study is within deer summer range on the east side of Flat Top Mountain. The range type is mountain brush intermixed with dense oak clones which vary in stature from 12 to 15 feet in some areas and waist high in others. The site has an east aspect and an elevation of about 7,000 feet. Slope varies from 25% at the bottom of the hill to 5% on the more level ridge top. Deer appeared to be utilizing the area in 1982 as pellet groups and bedding areas were abundant. Pellet group data taken on the site in 1998 and 2003 estimated a moderate amount of deer use at 40 days use/acre (99 ddu/ha) in 1998 and 68 deer days use/acre (167 ddu/ha) in 2003. The site was also being utilized by a small number of Mormon crickets in 2003.

Soil is derived from basalt parent material. Basalt rocks are common on the soil surface, especially on the ridge top. Soil depth is deep with an estimated effective rooting depth of 16 inches. Texture is a loam which is moderately acidic (pH 5.6). Soil organic matter is relatively high at 5.2%. Soil erosion is not a problem on the site, although roads in the area are severely gullied.

Being summer range, shrubs are not as important a forage source as grasses and forbs are. However, the most abundant browse species on the site is Gambel oak. It provided 65% of the browse cover in 1998 and 84% in 2003. Oak varies in size from tall tree-like forms that are 12 to 15 feet in height, to lower growing forms that are only waist high. The oak has shown mostly light to moderately use, displayed good vigor with few decadent plants sampled during all readings. It appears to be thickening as cover nearly doubled since 1998 and the number of stems/acre increased by 35%. Line-intercept canopy cover for oak was estimated at 44% in 2003.

Understory shrubs include Utah serviceberry, mountain big sagebrush, and snowberry. Mature serviceberry averaged about 5 feet in height in 2003. They were mostly heavily hedged where available, but they were in good vigor. Mountain big sagebrush occur in limited numbers. They were classified as heavily hedged in 1998, but showed light to moderate use in 2003. Snowberry appears to be unutilized. There are also a few bitterbrush on the site that were not abundant enough to be adequately sampled. All plants were heavily hedged to the point of being mostly unavailable.

The herbaceous understory is dominated by forbs which provided 83% of the total herbaceous cover in 1998 and 74% in 2003. Grasses are represented by only one species, mutton bluegrass. Forbs are diverse and abundant with the primary species consisting of arrowleaf balsamroot, western waterleaf, tuber starwort, Pacific aster, and American vetch.

1982 APPARENT TREND ASSESSMENT

Range trend appears stable on this site. Soil movement is minimal and there are few areas not covered by litter or vegetation. Vegetatively, the area appears static, although there may be a trend toward taller, more mature oak trees and increasing shade. This may prove detrimental in the long run to some of the secondary browse species and some forbs.

1998 TREND ASSESSMENT

Trend for soil is stable with little bare ground exposed. Litter cover declined from 81% to 59%, likely due to the much larger sample used in 1998 which sampled more area outside of the oak clones. Trend for browse appears stable with some of the changes in density due to the much larger sample. Utilization is heavier on understory shrubs, but similar on oak. Reproduction of the key species appears adequate to maintain their populations. Trend for the herbaceous understory is up slightly. Quadrat frequency of mutton bluegrass increased from 2% to 41%. Quadrat frequency of perennial forbs also increased.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - up slightly (4)

2003 TREND ASSESSMENT

Trend for soil is stable. There is excellent protective ground cover and little bare soil exposed. Erosion is not a problem on the site. Trend for browse is down slightly for mountain big sagebrush and up for Gambel oak. Mountain big sagebrush declined 31% in density from 780 to 540 plants/acre and the number of decadent plants increased to 30% of the population. No seedlings or young were sampled. Gambel oakbrush has nearly doubled in cover. The increase in oak will have a negative effect on understory shrubs. Overall the browse trend is considered slightly down. The most important aspect of this site is the herbaceous understory since this site is used primarily as summer range. Trend for the herbaceous understory is also mixed. Trend for perennial grasses is stable. Mutton bluegrass makes up virtually all of the grass cover and it has remained stable in nested frequency. However, grasses provide only 26% of the total herbaceous cover and forbs provide 74%. Trend for forbs is down due to a major decline in the sum of nested frequency for perennial species. Average cover of forbs has also declined from 28% in 1998 to 18% in 2003. The primary species, Pacific aster, arrowleaf balsamroot, western waterleaf, tuber sandwort, and American vetch all declined significantly in nested frequency. Drought conditions for the past few years are the likely reason for these trends. An unknown amount of Mormon cricket use has also helped determine changes in trend. A return to normal precipitation patterns should help reverse these trends.

TREND ASSESSMENT
soil - stable (3)
browse - down slightly (2)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Management unit 30 , Study no: 45

Type	Species	Nested Frequency		Average Cover %	
		'98	'03	'98	'03
G	Bromus carinatus	-	8	-	.24
G	Poa fendleriana	110	103	5.82	6.05
G	Stipa columbiana	-	6	-	.10
Total for Annual Grasses		0	0	0	0
Total for Perennial Grasses		110	117	5.82	6.40
Total for Grasses		110	117	5.82	6.40
F	Agoseris glauca	1	-	.00	-
F	Allium spp.	$_{b}$44	$_{a}$7	.46	.02
F	Arabis spp.	1	7	.00	.04
F	Aster spp.	$_{b}$49	$_{a}$32	1.05	1.42
F	Balsamorhiza sagittata	$_{b}$108	$_{a}$85	11.13	12.56
F	Calochortus nuttallii	1	-	.03	-

Type	Species	Nested Frequency		Average Cover %	
		'98	'03	'98	'03
F	Chenopodium fremontii (a)	-	7	-	.01
F	Conium maculatum	-	5	-	.42
F	Collinsia parviflora (a)	1	9	.00	.02
F	Crepis acuminata	1	3	.00	.00
F	Cymopterus spp.	9	-	.22	-
F	Galium spp.	-	2	-	.00
F	Hydrophyllum occidentale	$_{b}$99	$_{a}$45	6.28	.91
F	Lupinus argenteus	4	2	.15	.03
F	Microsteris gracilis (a)	34	21	.15	.13
F	Petradoria pumila	8	7	.21	.24
F	Phlox austromontana	10	4	.45	.04
F	Phlox longifolia	-	3	-	.03
F	Polygonum douglasii (a)	-	3	-	.00
F	Senecio multilobatus	9	13	.24	.11
F	Stellaria jamesiana	$_{b}$191	$_{a}$121	6.17	1.90
F	Taraxacum officinale	3	-	.03	-
F	Vicia americana	$_{b}$77	$_{a}$27	1.09	.11
F	Zigadenus paniculatus	6	4	.03	.01
Total for Annual Forbs		35	40	0.15	0.17
Total for Perennial Forbs		621	367	27.60	17.88
Total for Forbs		656	407	27.76	18.06

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 30 , Study no: 45

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Amelanchier utahensis	9	2	.19	.81
B	Artemisia tridentata vaseyana	16	13	2.12	1.44
B	Chrysothamnus depressus	2	1	-	.15
B	Chrysothamnus viscidiflorus viscidiflorus	1	0	.03	-
B	Opuntia spp.	3	3	-	-
B	Prunus virginiana	0	1	-	-
B	Quercus gambelii	67	68	11.91	22.98

B	Symphoricarpos oreophilus	14	15	4.13	1.93
Total for Browse		112	103	18.40	27.33

CANOPY COVER, LINE INTERCEPT --
Management unit 30 , Study no: 45

Species	Percent Cover	
	'98	'03
Amelanchier utahensis	-	2.40
Artemisia tridentata vaseyana	-	2.25
Opuntia spp.	-	.33
Quercus gambelii	8.60	44.20
Symphoricarpos oreophilus	-	4.23

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 30 , Study no: 45

Species	Average leader growth (in)
	'03
Amelanchier utahensis	2.8
Artemisia tridentata vaseyana	1.0
Purshia tridentata	2.4

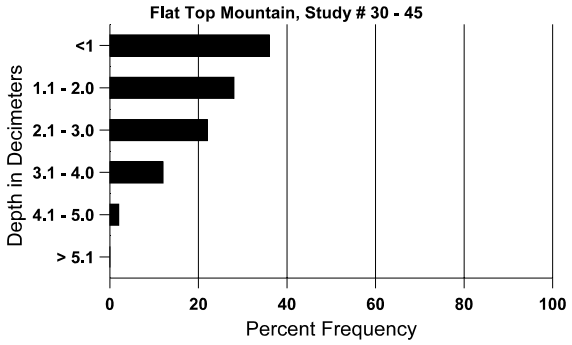
BASIC COVER --
Management unit 30 , Study no: 45

Cover Type	Average Cover %	
	'98	'03
Vegetation	46.23	48.97
Rock	21.60	22.73
Pavement	2.88	1.31
Litter	58.93	43.52
Bare Ground	5.19	8.32

SOIL ANALYSIS DATA --
Management unit 30, Study no: 45, Study Name: Flat Top Mountain

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
16.3	59.6 (11.34)	5.6	38.0	37.4	24.5	5.2	52.1	435.2	0.6

Stoniness Index



PELLET GROUP DATA --
Management unit 30 , Study no: 45

Type	Quadrat Frequency	
	'98	'03
Rabbit	-	1
Deer	17	9

Days use per acre (ha)	
'98	'03
-	-
40 (99)	68 (167)

BROWSE CHARACTERISTICS --
Management unit 30 , Study no: 45

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Amelanchier utahensis											
82	**200**	-	-	200	-	-	0	0	-	0	10/10
98	**800**	180	280	520	-	20	70	0	-	0	46/31
03	**40**	-	-	40	-	-	0	50	-	0	64/67
Artemisia tridentata vaseyana											
82	**66**	-	-	66	-	-	0	0	0	0	15/16
98	**780**	-	20	740	20	80	36	59	3	3	13/27
03	**540**	-	-	380	160	80	30	7	30	4	14/27
Chrysothamnus depressus											
82	**133**	-	-	133	-	-	100	0	-	0	7/16
98	**440**	-	420	20	-	-	0	0	-	0	8/15
03	**20**	-	-	20	-	-	100	0	-	0	7/19
Chrysothamnus viscidiflorus viscidiflorus											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**20**	-	20	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	30/61

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Opuntia spp.											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**80**	-	-	80	-	-	0	0	-	75	8/17
03	**100**	-	-	100	-	-	0	0	-	0	6/15
Prunus virginiana											
82	**1066**	-	-	1066	-	-	0	0	-	0	10/5
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**20**	-	20	-	-	-	0	0	-	0	-/-
Purshia tridentata											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	20	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	-/-
Quercus gambelii											
82	**7599**	66	1133	6466	-	-	30	4	0	0	19/20
98	**6760**	160	1320	5320	120	740	21	0	2	0	44/30
03	**10420**	40	2780	6500	1140	1120	12	7	11	4	46/30
Symphoricarpos oreophilus											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**980**	100	100	880	-	-	0	0	-	0	21/30
03	**1160**	-	180	980	-	-	0	5	-	0	17/42